

**REMARKS**

Claims 1-5 and 7-21 are pending in the application. No claims have been amended by this Response. No new matter has been added.

Claims 1, 2, 8, 10, 12, 13, 14 and 18 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1, 5, 6, 9, 12, 13, 14, 15, 16, 17 of U.S. Patent No. 7,507,866.

The Office Action asserts that the claims in this application and in Urtel are not patentably distinct but fails to specify which features are considered to be co-extensive in claim scope. Applicants note that claim 1 recites a noble metal selected from the group consisting of Pt, Pd, Rh, Ir, Ag, and Au. Claim 1 of Urtel, however, recites rhenium. As such, the pending claims in this application are patentably distinct from Urtel because Urtel claims a rhenium catalyst whereas the pending claims recite catalysts comprising Pt, Pd, Rh, Ir, Ag, or Au.

At page 3, paragraph 2, the Office Action asserts that Applicants cannot rely on the filing date of priority application DE 10 2004 007 498.4 because a translation has not been made of record. The Office Action does not accurately describe the requirements for claiming foreign priority. As evidenced by the U.S. Patent and Trademark Office's PAIR website, Applicants claimed priority to DE 10 2004 007 498.4 as of the filing date of this application, in compliance with 37 CFR §1.55 (a)(1)(i). Thus, Applicants may submit a certified translation of DE 10 2004 007 498.4 to overcome a citation relied upon by the Examiner, in accordance with 37 CFR §1.55 (a)(4)(i)(B), and, in fact, do so concurrently herewith.

It may be possible that the Office Action confuses a claim to priority, as set forth in 35 C.F.R. 1.55 (a)(1)(i), which must be presented during the pendency of the application, and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior foreign application, with the filing of the priority papers under 35 U.S.C. 119(a)-(d), which makes the record of the file of the United States patent complete. As noted above, Applicants timely claimed priority with the filing of this application.

At pages 3-4, the Office Action applies WO 2004/022522 to Fischer as a citation under 35 U.S.C. §102(e). However, Fischer is not available as a citation under 102(e) because it was not published in the English language. See MPEP, Eighth Edition, August 2001, Revision July 2008, at page 700-34. Accordingly, this rejection fails.

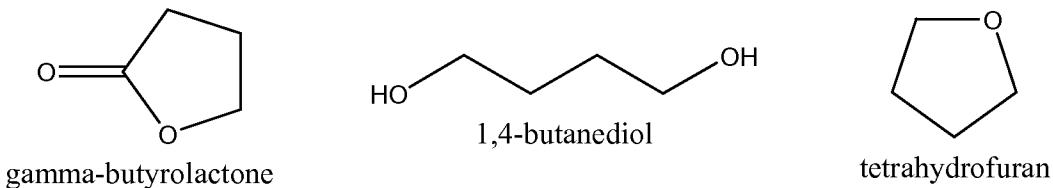
Applicants note that published application DE 102 41 292 to Fischer, which is the priority document of the above-noted international application to Fisher, was published on March 18, 2004, which is after the February 13, 2004 priority date of this application. As set forth above, the concurrent filing of the certified English-language translation of DE 10 2004 007 498.4 herewith would overcome any rejection of the pending claims over DE 102 41 292.

Claims 1-5 and 7-21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over US Patent No. 4,985,572 to Kitson et al. in view of US Patent No. 5,731,479 to Antons.

Claim 1 recites, among other features, a process for preparing optically active hydroxy-, alkoxy-, amino-, alkyl-, aryl- or chlorine-substituted alcohols or hydroxy carboxylic acids having from 3 to 25 carbon atoms or their acid derivatives or cyclization products. Applicants respectfully submit that this feature is not suggested in Kitson.

The Office Action asserts, at page 9, that “any kind of carboxylic acids and their anhydrides will produce corresponding alcohol and/or carboxylic acid ester.” However, Applicants note that a hydrogenation process of a non-chiral reactant, and without any chiral induction, does not yield an optically active product. Moreover, chiral reactants racemize, i.e., form non-optically active products, unless the reaction parameters, such as temperature or choice of catalyst, allow for retention of chirality. As such, there is no indication in Kitson that the hydrogenation reaction suggested therein would retain the chirality of a reactant and, thus, result in the production of an optical active product.

In this context, Applicants respectfully disagree with the assertion in the Office Action at page 9 that  $\gamma$ -butyrolactone, 1, 4-butanediol, or tetrahydrofuran are optically active. In fact, none of the compounds depicted below is optically active:



As evidenced by the enclosed excerpt from "Physical Chemistry," P.W. Atkins, p. 433, forth edition, Oxford University Press, 1990, a molecule that can be superimposed on its mirror image cannot be a chiral molecule. However,  $\gamma$ -butyrolactone, 1, 4-butanediol, or tetrahydrofuran can be superimposed on their respective mirror images; these molecules are, therefore, not chiral and do not possess optical activity.

The Office Action relies on Antons for teaching a process for the preparation of optically active alcohols. However, Antons fails to teach a catalyst as claimed. Moreover, Antons teaches hydrogenation in the presence of a ruthenium catalyst. As described throughout Applicants' disclosure, in particular at page 2, lines 14-18, ruthenium catalysts have a high tendency to decarbonylate the reactants or the products. As such, ruthenium-containing catalysts are outside the scope of the claimed subject matter.

The Office Action asserts that Kitson suggest avoiding ruthenium. This assertion is incorrect. Quite to the contrary, Kitson suggests, at col. 2, line 44, that ruthenium is a preferred noble metal of Group VIII of the Periodic Table of the Elements. Nevertheless, Kitson also suggest that catalysts not containing ruthenium may be used in the hydrogenation of non-chiral reactants.

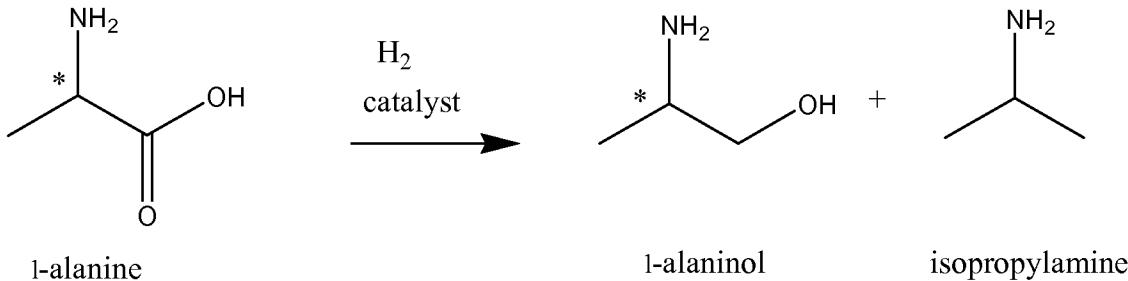
It is duly noted that Antons teaches the use of a ruthenium-containing catalyst. Accordingly, Antons apprises the skilled artisan on how to prepare optically active alcohols for the reactants, reaction conditions, and catalyst used therein. Antons fails to teach that the reactants therein may be hydrogenated with the catalyst of Kitson. In fact, Antons teaches away from using a different catalyst because Antons teaches, at col. 4, line 60, to col. 5, line 5, that copper chromite catalysts lead to racemization, i.e., to non-optically active products and that Raney nickel catalysts partially dissolve and no propane-1,2-diol could be isolated. Thus, a

skilled artisan would learn from Antons that one may not simply change to a different catalyst and expect to still obtain optically active products.

Applicants further enclose a copy of the article to Studer et al., which is also referred to in Applicants' disclosure at page 2, lines 8-12. Studer describes a catalytic hydrogenation with the Nishimura catalyst at 25 °C. As set forth at the end of the second paragraph at page 803, varying the process conditions, such as using a different catalyst or increasing the temperature, may lead to racemization, i.e., to the formation of an optically active isomer.

In addition, even if the citations could have been combined in the manner suggested in the Office Action, a skilled artisan would not have expected the experimental results achieved by the claimed process. In particular, Applicants compared the ruthenium catalyst disclosed in Antons for the hydrogenation of optically active carboxylic acids, using the example of L-alanine, with a Pt/Sn-on carbon black catalyst as claimed.

Specifically, the following hydrogenation reaction of L-alanine to L-alanitol was monitored for both catalysts and the formation of the undesired side-products isopropylamine measured:



The hydrogenation of L-alanine, as shown above, was carried out in the presence of i)Ru-black, the catalyst according to Antons, and ii) on Pr/Sn-on-carbon, which is a preferred embodiment of the claimed subject matter. Hydrogenation took place under identical reaction conditions, which are the same as example 2 of Applicants' disclosure. Specifically,

hydrogenation was performed in a stainless steel autoclave at 100 °C at a hydrogen pressure of 200 bar.

The results after a hydrogenation time of 12 hours are summarized in the following table. After converting more than 99% of L-alanine to L-alaninol, no decarbonylation side reaction could be detected with the Pt/Sn-on-carbon catalyst.

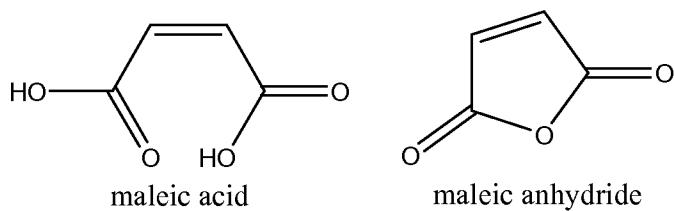
Catalyst	L-alanine (wt.-%)	L-alaninol	Conversion of L-alanine (%)	Isopropylamine (wt-%)	Selectivity of iso- propylamine (%)	Selectivity of alaninol (%)
Ru-black	<0.005	2.0	> 99	0.07	0.6	13.5
Pt/Sn-on- carbon	< 0.005	3.6	> 99	< 0.005	0.0	24.3

Remarkably and unexpectedly, the claimed process reduces the unwanted formation of isopropylamine to under 0.005 wt.-%.

Applicants have presented the above experimental data already in the response to the previous Office Action filed January 15, 2009. The April 2, 2009 Office Action fails to acknowledge that Applicants supplied this data, let alone comment on the persuasiveness of the data supplied. As such, the Office Action failed to meet its burden of answering all asserted advantages, as set forth in MPEP 707.07(f).

Moreover, the reasons set forth in the Office Action are insufficient to explain why a skilled artisan would have been motivated to combine the applied citations in the manner suggested. The Office Action asserts, at page 7, line 7, that Kitson and Antons both teach optically active alcohols. This assertion is incorrect because Kitson fails to suggest the features

that the Office Action attributes to this citation. Specifically, the compounds suggested in Kitson at col. 6, line 38, maleic acid and malaic [sic] anhydride do not have a stereocenter in the  $\alpha$ - or  $\beta$ -position, as asserted in the Office Action, or at any other position in the molecule. Maleic acid and maleic anhydride have the following structures:



As can be seen from the above structures, no stereocenter is present in maleic acid or in maleic anhydride.

In addition, the Office Action insufficiently explained under what rationale or why a skilled artisan would have been motivated to combine Kitson and Antons in the manner suggested. Focusing on the obviousness of substitutions or differences is improper; rather, the claimed invention must be considered as a whole. *Gillette Co. v. S.C. Johnson & Son Inc.*, 919 F.2d 720, 724 (Fed. Cir. 1990). Moreover, it is impermissible simply to engage in a hindsight reconstruction of the claimed invention, using the patent as the template and selecting elements from references to fill the gaps. E.g., *In re Rouffet*, 149 F.3d 1350, 1358 (Fed. Cir. 1998), citing *In re Gorman*, 933 F.2d 982, 986 (Fed. Cir. 1991), citing in turn *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143 (Fed. Cir. 1985).

Simply because claim features may be known in the art is insufficient for a finding of obviousness. “[A] patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l v. Teleflex Inc.* 127 S. Ct. 1727, 1731 (2007). Rather, there must be a well reasoned or articulated rationale to combine the references or “something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.” E.g., *Rouffet* 149 F.3d at 1356, and the cases cited therein. See also *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004),

citing *Rouffet; Sibia Neurosciences*, 225 F.3d at 1356; *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546 (Fed. Cir. 1998). As variously stated by the Federal Circuit, there must be some reason, teaching, suggestion, interference, motivation, or incentive in the prior art to make the selections made by the inventor and combine the prior art to produce the claimed invention. E.g., *Rouffet*, 149 F.3d at 1355; *Pro-Mold and Tool Co. v. Great Lakes Plastics Inc.*, 75 F.3d 1568, 1573 (Fed. Cir. 1996); *Gorman*, 933 F.2d at 986-987; and *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n.24 (Fed. Cir. 1985), *cert. denied*, 475 U.S. 1017 (1986). Further, a motivation to combine only flows from the combination that is, on balance, desirable, not merely feasible. See *In re Fulton*, 391 F.3d at 1200, citing *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000). As explained by the *Winner Int'l Royalty Corp.* court, “[t]rade-offs often concern what is feasible not what is, on balance, desirable. Motivation to combine requires the latter.”

The United States Supreme Court, in *KSR Int'l*, 127 S. Ct. at 1740-41, cited with approval the Federal Circuit's reasoning that “rejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). Accordingly, even if the citations could somehow be interpreted to together suggest all of the features of the claimed subject matter, the Office Action failed to provide motivation or a proper rationale as to why a skilled artisan would have combined Kitson and Antons to arrive at the presently claimed subject matter because, in spite to the Office Action's assertion to the contrary, Kitson fails to suggest molecules having a stereocenter.

In view of the above, Applicants believe the pending application is in condition for allowance.

Application No. 10/588,948  
Response dated October 2, 2009  
After Final Office Action of April 2, 2009

Docket No.: 12810-00340-US1

Applicants concurrently herewith submit the requisite fee for a Petition for a three-month Extension of Time and a Notice of Appeal. Applicants believe no additional fee is due with this response. However, if any such additional fee is due, please charge our Deposit Account No. 22-0185, under Order No. 12810-00340-US1 from which the undersigned is authorized to draw.

Dated: October 2, 2009

Respectfully submitted,

Electronic signature: /Georg M. Hasselmann/  
Georg M. Hasselmann  
Registration No.: 62,324  
CONNOLLY BOVE LODGE & HUTZ LLP  
1875 Eye Street, NW  
Suite 1100  
Washington, DC 20006  
(202) 331-7111  
(202) 293-6229 (Fax)  
Attorney for Applicant